

# Using Hospitalization Rates to Track the Economic Costs and Benefits of Improved Diabetes Care in the Americas

A proposal for health policy makers

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**D**iabetes presents a vast worldwide socioeconomic burden; its disabilities reduce quality of life and result in enormous and increasing direct and indirect medical costs (1–6). Although these costs result from a variety of factors, chronic complications account for more than 50% of the total costs for diabetes care; the remaining costs are for the treatment of diabetes per se (1,6,7). These complications can be significantly reduced by control of blood glucose and associated cardiovascular risk factors (10–12). For example, each 10% increase in HbA<sub>1c</sub> is accompanied by a parallel 20% increase in the rate of microalbuminuria, a 56% increase in the rate of retinopathy, and a 64% increase in the rate of progression of retinopathy (13).

Despite this clear and convincing evidence of the feasibility and benefits of prevention of chronic complications and the widely distributed guidelines for the care of diabetes (14,15), the current quality of care of people with diabetes is generally suboptimal, even in developed nations (16,17). As the burden of diabetes increases, it is reasonable to predict that the problem will get worse, because the increasing incidence and survival of patients with diabetes, combined with suboptimal care, will increase the prevalence of diabetes complications.

Diabetes presents a particular challenge to developing countries for many reasons. First, the incidence and prevalence of diabetes are increasing dramatically in devel-

oping countries with westernization (18); the World Health Organization (WHO) estimates that developing nations will have the largest prevalence of the disease in the near future (19). Second, 80% of the diabetes disability-adjusted life-years lost worldwide already occurs in developing countries (20). Third, despite increasing knowledge of and technologies for the control and treatment of diabetes and its complications, the cost of new technologies have made them inaccessible in developing countries. Lastly, many countries face serious constraints in their health budgets; allocation or reallocation of funds will require careful prioritization to resolve the critical problems that diabetes increasingly presents.

Unfortunately, health policy makers are frequently unaware of (or have failed to act upon) either the strong evidence for the role of lifestyle changes (e.g., adopting healthy lifestyle habits, increasing physical activity, and adhering to an appropriate diet [21,22]) in the primary prevention of type 2 diabetes or the therapeutic and educational strategies to prevent or delay diabetes complications.

To address this problem, representatives from a wide variety of organizations, including WHO, the European Health Ministries, and various diabetes organizations, have issued a call for action in the Saint Vincent Declaration (23) to decrease the socioeconomic impact of diabetes. In the U.S., we have launched the National

Diabetes Education Program (23,24). With a similar aim, organizations from the Americas have launched the Declaration of the Americas (25). These initiatives urge the development of educational programs and national plans for the prevention and treatment of diabetes, and they have established the minimum international standards for the care of people with diabetes.

## What are the realistic alternatives to achieve the goal of reducing the social and economic burden of diabetes in developing countries?

It is difficult to answer fairly the question of how to define and assure quality diabetes care or how to appropriately allocate funds to support quality assurance. Diabetes care researchers and investigators have certainly provided us the evidence and the tools to solve the problem (10–12,26–30). It has also been shown that implementation of diabetes care programs at the national, provincial, or county levels and the use of prevention strategies taught by health care teams can result in two main objectives: the improvement of quality of care and the optimization of human and economic resources. Such programs (e.g., DIABCARE [31] in Europe and PRODIABA [32] and PROPAT [33] in Argentina) reduce the cost of care and improve quality of life and patient satisfaction. In this context, the cost of the solution—at least for decision makers and health ministries—is a major barrier because they will need to allocate or reallocate current resources. Such a task will require the reallocation of resources today in order to liberate resources tomorrow, which, of course, is never a popular political alternative.

In the U.S. and in many European countries, data are readily available to assess current costs of diabetes care and its quality (1,34). Even so, there are ongoing debates about how to define optimal care in these countries. In many developing countries, even the most basic figures on costs are unavailable. Furthermore, we contend that most if not all policy makers in devel-

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**Abbreviations:** IDF, International Diabetes Federation; WHO, World Health Organization.

oping countries do not know how costly a burden the disease is on their health care system, how effective (or ineffective) current diabetes treatment strategies are for diabetic subjects, and how diabetes care could be optimized.

Thus, we will have to develop strategies that bridge the gap between scientific knowledge and the real world. To accomplish this (i.e., the reallocation funds to the prevention and treatment of diabetes), we will have to provide clear evidence (cost-benefits and cost-efficacy) to convince health policy makers to support such a reallocation. Therefore, all members of diabetes community need to be aware that every allocation of funds is the result of vigorous competition among several priorities resulting from the pressing economic state of the health care systems of developing countries.

### What can be done to help those countries to overcome such a lack of information?

Starting with the basics, it is known that, in most countries, diabetes consumes between 5 and 10% of the health budget and that ~50% or more of that cost is related to hospitalization (1,34,35). Estimation of the total direct cost of diabetes is not an easy task, but cost of hospitalization can be estimated. Using a relatively simple protocol, hospitalization causes, rates, and length of stay (and its subsequent cost) could be useful indicators to measure efficacy of current care and any intervention implemented to improve quality of care. Measurement of hospitalization rates and costs could also provide the basic data to estimate the indirect costs related to loss of production. Thus, determination of hospital costs could provide a useful tool, a tracer if you will, to estimate a significant portion of the current costs of caring for diabetes and its complications in a given country or area within a country, thereby providing the basis for designing, implementing, and evaluating intervention strategies and setting priorities for resource allocation.

### Is this strategy feasible, and, if so, how it could be accomplished?

Recently, WHO and the International Diabetes Federation (IDF) Task Force on Diabetes Health Economics prepared a document that broadly outlined the worldwide economics of diabetes and diabetes care (2). Distribution of this information to health policy makers would certainly be an excellent beginning to implementing the

strategy. The same group provided an update that included both information on costs and the effectiveness of interventions (36). In addition, this group, in collaboration with the Diabetes Health Economics Study Group, possesses sufficient expertise to prepare a simple and suitable protocol to approach the problem and to study the cost of diabetes hospitalization. They could also train people for its appropriate usage and organize and lead an international multicenter study with participation by representatives from many countries. Emphasis could be placed on recruiting groups from developing countries.

The resultant estimations of hospital costs of diabetes in developing countries would allow us to evaluate the costs and benefits of the implementation of strategies designed to improve diabetes care and to reduce its complications. These data will be critical in the debate over appropriate allocation of funds to treat diabetes and prevent complications. We urge the IDF Task Force on Diabetes Health Economics in collaboration with the Diabetes Health Economics Study Group to continue their work in the development and implementation of a protocol to study the cost of diabetes hospitalization in developing countries. Failure to act now will mean that we will be dealing with the avoidable burden of diabetes complications in the new century.

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